Nurein Umeya

https://github.com/cl0udsw1tch

Experience

LeddarTech   Sept 2023 – May 2024

Software Engineer Intern
- Helped build road lane detection in a computer vision application for motor vehicles.
- Used C++, bash, CMake, Git, GDB, CI/CD tooling in bitbucket, and developed in a Linux environment.
- Extensive profiling, optimizing, and rewriting of code to achieve 15 frames of processing a second in embedded Nvidia devices.
- Worked in a high pace AGILE environment, frequently completing sprints.
- Performed code review for colleagues.

University of Toronto   Sept 2022 – May 2023

Math TA
- Teaching assistant for 1st and 2nd year linear algebra, multivariable calculus and vector calculus (4 courses)
- Taught lessons, graded assignments/tests, and tutored students after-hours.

Private Tutor
- Tutored in vector calculus (Math), runtime analysis and algorithms (CS)

Projects

AI TCP [AI Time Complexity Predictor] (Java, Python, Pytorch)
- A Java preprocessor using the Javaparser library to iterate and replace parsed nodes in Java source code strings with custom tokens (ex: {int foo = 1} >>> {int VAR_0 = INTEGER_LITERAL }
- A PyTorch LSTM model with a custom tokenizer to tokenize source code strings, with a classifier to classify time complexity into 7 distinct classes (O(1), O(n)...)
- A VSCode extension for users to highlight source code and get a time complexity prediction. Build with the developer in mind to help produce more efficient code and find inefficiencies faster

Blockchain (Golang, SQLite)
- A layer one proof of work blockchain implemented from scratch, with a CLI and JSON RPC
- Objects such as blocks, transactions etc. use specific serialization/deserialization formats to exchange bytes between processes running nodes.
- Includes a stack-based interpreter module to run opcodes for verifying transaction signatures (like Bitcoin)

Ember (C++)
- Ember is a C++ library focused on providing essential data structures for use in graph-related algorithms and other utilities. Includes algorithms on sequences, graph traversal algorithms etc.

AIM [AI Manipulator] (C++, Python)
- C++ graphics via OpenGL with a custom Blender model.
- Custom build CNN
- IPC used to manipulate the model via webcam input processed by the CNN

WDI App (React, HTML+CSS+TS, Flask + Python) (https://wdi-app.cloudswitch.ca)
- Graphical UI displaying the thousands of development indicators for each country by year collected by the World Bank.

Skills

C, C++, Bash, Typescript, React, Docker, Gitlab CI/CD, Solidity, Golang, PHP, SQL, Git, Python, MATLAB, Make, CMake, React-native, NextJS, Svelte and SvelteKit, NodeJS, HTML, CSS, Sass, Pandas, Numpy, PyTorch, ExpressJS, Algorithms

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Education

University of Toronto

Master's of Engineering, Mechanical (Robotics & Machine Learning/Data Science)   January 2023 – April 2025

- ● Knowledge base: Path Planning, Perception, Data-science, Machine Learning, Computational Fluid Dynamics, State Estimation, Robotics